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# Contribution to knowledge of the Balkan Macroheterocera: new and rare species for Bulgaria, North Macedonia and Albania

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**Abstract.** The Balkan Lepidoptera fauna is still not comprehensively known. We present here some new records for three Balkan countries. *Polymixis xanthomista* (Hübner, [1819]) is confirmed for the Balkan Peninsula from Albania, *Eriogaster inspersa* Staudinger, 1879 is reported new for the Republic of North Macedonia (second locality in Europe), and *Mythimna languida* (Walker, 1858) is new for Bulgaria. Some other species (*Ctenoplusia accentifera* (Lefèbvre, 1827), *Anchoscelis luteogrisea* (Warren, 1911), *Griposia bouveti pinkeri* (Kobes, 1973) and *Egira anatolica* (Hering, 1933)) are confirmed for these countries. We provide illustrations of the species and their genitalia when necessary for confirmation.

## Introduction

The Balkan Peninsula is one of the biodiversity hotspots in Europe (Griffiths et al. 2004) and is very rich in butterflies and moths (Varga 2014). On the Balkan Peninsula there are 13 countries, which have been unequally investigated for their Lepidoptera, especially as regards the nocturnal species. Bulgaria is perhaps one of the best explored countries and new additions to the national list are becoming increasingly difficult to find (Beshkov 2017). Northern Macedonia is less explored and new species for this country are still easily found. Albania is still poorly investigated, and in fact about 50 new species for the country have recently been recorded in a single publication only (Beshkov and Nahirnić 2018a). The poorly known faunas of such countries are mostly due to the paucity of local lepidopterists, little use of modern collecting methods and lack of through the year research (cf. "winter moths" in Beshkov 2018). For these reasons much of the research has been carried out by Bulgarian and west European workers (Beshkov 2014; Tóth 2019; Plant et al. 2020). Here we present some of the results from the years 2003–2020 and corrected data for a specimen of *Eriogaster inspersa* Staudinger, 1879 treated in Beshkov and Gashtarov (2014).

## Methods

The collecting methodology involved two or three portable light traps with an 8W BL 368 black light and 8W BL812 black light tubes, both powered by 12V 9Ah batteries: a Finnish "tent trap" with a 160W mercury vapour bulb at the top of the pole and a 20W BL368 mini-lynx black light compact lamp over the catching pot below. An additional 20W BL368 mini-lynx black light com-

pact lamp was also positioned about 70 m from the tent trap. The distance between the Finnish "tent trap" and the light traps, as well as between the light traps themselves, was sometimes more than 1 km, as they were deployed in different habitats and conditions wherever possible. All traps ran throughout the night.

After dissection and staining with a 2% Merbromin solution (Mercurochrome), the genitalia were fixed on glass slides in Euparal mountant. All genitalia slides were photographed with a Zeiss stereo microscope Stemi 2000-C with AxioCam ERc 5s digital camera. The moths and collecting sites were photographed with a Sony DSChX400v digital camera. The habitat of *Eriogaster inspersa* was photographed with an Olympus SZ-20 digital camera. The genitalia slides were prepared by S. Beshkov and are part of collection of S. Beshkov, which is part of the Museum collection (National Museum of Natural History, Sofia (**NMNHS**)).

In the case of the genus *Agrochola* sensu auct. we follow the taxonomic arrangement proposed by Ronkay et al. (2017).

## Results and discussion

Results from years 2003 to 2020 are summarised. Most records are relatively new (2019–2020), and the only revised material is from an earlier period (2003–2013). We provide here data for seven species that are very rare in or new to Balkan countries.

### List of the species

**Lasiocampidae**

***Eriogaster inspersa* Staudinger, 1879**

Beshkov and Gashtarov (2014) reported and illustrated a single aberrant male of *Eriogaster rimicola* ([Denis & Schiffermüller], 1775) caught in March. This specimen was collected in Northern Macedonia (that time known as the former Yugoslav Republic of Macedonia), at Middle Vardar river valley near Demir Kapiya town, 130 m, 41°24'12"N, 22°17'19"E, 08.iii.2013 (Fig. 1). The habitat is pseudomaquis with *Quercus coccifera* L., *Quercus* sp., *Paliurus spina-christi* Mill. and *Platanus orientalis* L., on limestone soil (Fig. 2). The specimen has incompletely developed hind wings and the forewings have a black elongate discal spot, not the round white spot exhibited by typical *E. rimicola*. According to Beshkov and Gashtarov (2014) perhaps low temperatures during the overwintering of the pupa were the reason for the black coloration of the discal spot. They did not dissect the specimen, remarking that the flight period was an anomaly. At that time *E. inspersa* was unknown from Europe. The specimen has now been dissected (gen. prep. 1/08.xi.2020 S. Beshkov) and we have established that it is *E. inspersa* Staudinger, 1879. Examination of the black discal spots shows that the black coloration is the result of leaked and dried haemolymph. Such a small black patch is also present on one of the hind wings. The male genitalia (Fig. 3) are very distinctive and correspond well to those of *E. inspersa* illustrated in de Freina (1988, as *E. nippei*) and Zolotuhin (2007). In fact, this species was illustrated and described as new by de Freina (1988) as *Eriogaster nippei* de Freina, 1988, later placed as a synonym of *E. inspersa* (see Zolotuhin 2007). Based on our record and information from Zolotuhin (2007), we confirm that specimen identified as *Eriogaster rimicola inspersa* Staudinger, 1879 in de Freina (1999) is not that species but a different taxon with autumn appearance

**Figure 1.** *Eriogaster inspersa*, male. North Macedonia, near Demir Kapiya, 08.iii.2013. Scale bar: 1 cm.

**Figure 2.** Collecting locality of *Eriogaster inspersa*. North Macedonia, near Demir Kapiya, 08.iii.2013.

**Figure 3.** *Eriogaster inspersa*, male genitalia. North Macedonia, near Demir Kapiya, 08. iii.2013. Scale bar: 1 mm.

that differs in the genitalia. The male genitalia of *E. inspersa* have a flattened, broad, plate-like vinculum (Zolotuhin 2007) whereas in *E. rimicola* the vinculum is narrow and short.

*Eriogaster inspersa* was reported as new for Europe from Greece by Rosenbauer and Theimer (2016). The specimen captured in North Macedonia is more than 300 km distant and the spot in the Vardar valley near Demir Kapiya is hence the most northern and western point of the range of this species. As far as we know, there is no other similar *Eriogaster* species with a spring flight period known from the Balkans.

**Noctuidae**

***Ctenoplusia accentifera* (Lefèbvre, 1827)**

SW Bulgaria, Struma river valley, rocky hill above the fishpond near Levunovo village, Sandanski district; ca 120 m, 41°29'29"N, 23°16'07"E, 18–20.x.2020, V. Gashtarov leg., 1 male (Fig. 4).

In Bulgaria *C. accentifera* was known only from a single specimen from the Rhodopi Mts, camp site below Trigrad village, Devin district, ca 800 m, 26.vi.1995, R. Radev leg., at light (Beshkov 2000). This is the second record for Bulgaria from a different region of the country, elevation and habitat.

**Figure 4.** *Ctenoplusia accentifera*, male. Bulgaria, near Levunovo, 18–20.x.2020. Scale bar: 1 cm.

### *Anchoscelis luteogrisea* (Warren, 1911)

N Macedonia, Prilep Region, Babuna Planina, Pletvar Pass, 960 m, 41°22'12"N, 21°40'11"E, 27.ix.2019, marble stony area with *Artemisia* spp., *Quercus trojana* Webb, *Ulmus* spp. etc., S. Beshkov & A. Nahirnić leg., 1 male (Fig. 5), genitalia examined; SW Bulgaria, between S Pirin and Alibotush Mts, "Izvora" Spring above Petrovo village, ca 640 m, 41°24'58"N, 23°33'3"E, 29.x.2019, S. Beshkov & A. Nahirnić leg., 1 male, genitalia examined; SW Bulgaria, Pirin Mts, Vlahi village, 556 m, 41°44'27"N, 23°13'46"E, 27.x.2020, S. Beshkov leg., 1 male, genitalia examined.

*Anchoscelis luteogrisea* is reported here for the second time from both North Macedonia and Bulgaria. In North Macedonia it was known only from Velestovo near Lake Ohrid and in Bulgaria only from Kresna Gorge (Beshkov 2016; Beshkov and Nahirnić 2018b). *Anchoscelis luteogrisea* is a late autumn species, only recently identified from Bulgaria, North Macedonia, Serbia and Albania. Because of small differences there is a possibility of misidentification with the closely related species *A. litura* (Linnaeus, 1758) (Beshkov and Nahirnić 2020).

### *Griposia bouveti pinkeri* (Kobes, 1973)

SW Bulgaria, Pirin Mts, Vlahi village, ca 560 m, 41°44'27"N, 023°13'46"E, 27.x.2020, S. Beshkov leg., 1 male (Fig. 6), genitalia with everted vesica examined (Fig. 7).

**Figure 5.** *Anchoscelis luteogrisea*, male. North Macedonia, Pletvar Pass, 27.ix.2019. Scale bar: 1 cm.

This is the second record of this species for Bulgaria, about 40 years after the first and from a fairly close location. In Europe *G. bouveti pinkeri* is known only from a few localities in Greece (Beshkov and Wegner 2004; Wegner 2002; Wegner 2011; Speidel et al. 2016), these two in Bulgaria, and from European Turkey (Ronkay et al. 2001). Misidentification with *G. aprilina* (Linnaeus, 1758) (= *G. wegneri* Kobes & Fibiger, 2003) is possible, but the genitalia, especially the aedeagus and vesica are very distinctive (Figs 7, 8). Differences in the clasper are easy to see after brushing the end of the abdomen. One of us (SB) checked a great number of specimens from Southern Bulgaria, Albania and North Macedonia, but all of them were *G. aprilina*, indicating that *G. bouveti pinkeri* may be very rare and local from those areas.

***Polymixis* (*Xanthomixis*) *xanthomista* (Hübner, [1819])**

S Albania, Gjirokaster County, Mt. Lunxhërisë, between Mal Çajup and Erind Village, ca 1010 m, 40°10'57"N, 20°09'58"E, mountain steppe with *Quercus* spp., *Carpinus orientalis* Mill., and *Acer* spp. trees on limestone, 02.x.2019, S. Beshkov and A. Nahirnić leg., 1 female (Fig. 9), genitalia examined, gen. prep. 1./23.xi.2020, S. Beshkov (Fig. 10).

To date, the only two specimens of this species known from the Balkan Peninsula have been recorded from Bulgaria: one from Iskarski Prolom Gorge, Tscherepisch Railway Station and one from Lakatnik Railway Station (Slivov and Lukov 1976 [1977]). According to Beshkov (2000), there are two females of *P. xanthomista* in the Slivov collection at the Institute of Biodiversity and Ecosystem Research of the Bulgarian Academy of Sciences, one labelled "Lakatnik, 14.10.1965, Al. Slivov" [=Lakatnik Railway Station] and the other "Tscherepisch, 13.10.1965, Al. Slivov". However, we doubt that these specimens are either correctly labelled or from Bulgaria. We suggest that they were received without labels and subsequently labelled, or that the labels were changed. Kolev (2002) and Ignatov et al. (2013) have described the doubt regarding the data of Alexander

**Figure 6.** *Griposia bouveti pinkeri*, male. Bulgaria, Vlahi Village, 27.x.2020. Scale bar: 1 cm.

**Figure 7.** *Griposia bouveti pinkeri*, male genitalia with everted vesica. Bulgaria, Vlahi Village, 27.x.2020. Scale bar: 1 mm.

Slivov and why a number of his records should be treated as doubtful. This is supported by the fact that above Lakatnik Railway Station one of us (SB) collected many times in the autumn without being able to confirm *P. xanthomista* from the area.

**Figure 8.** *Griposia aprilina*, male genitalia with everted vesica. Bulgaria, S Black Sea Coast, Ropotamo, 18.x.2005. Scale bar: 1 mm.

**Figure 9.** *Polymixis xanthomista*, female. Albania, Mal Çajup - Erind Village, 02.x.2019. Scale bar: 1 cm.

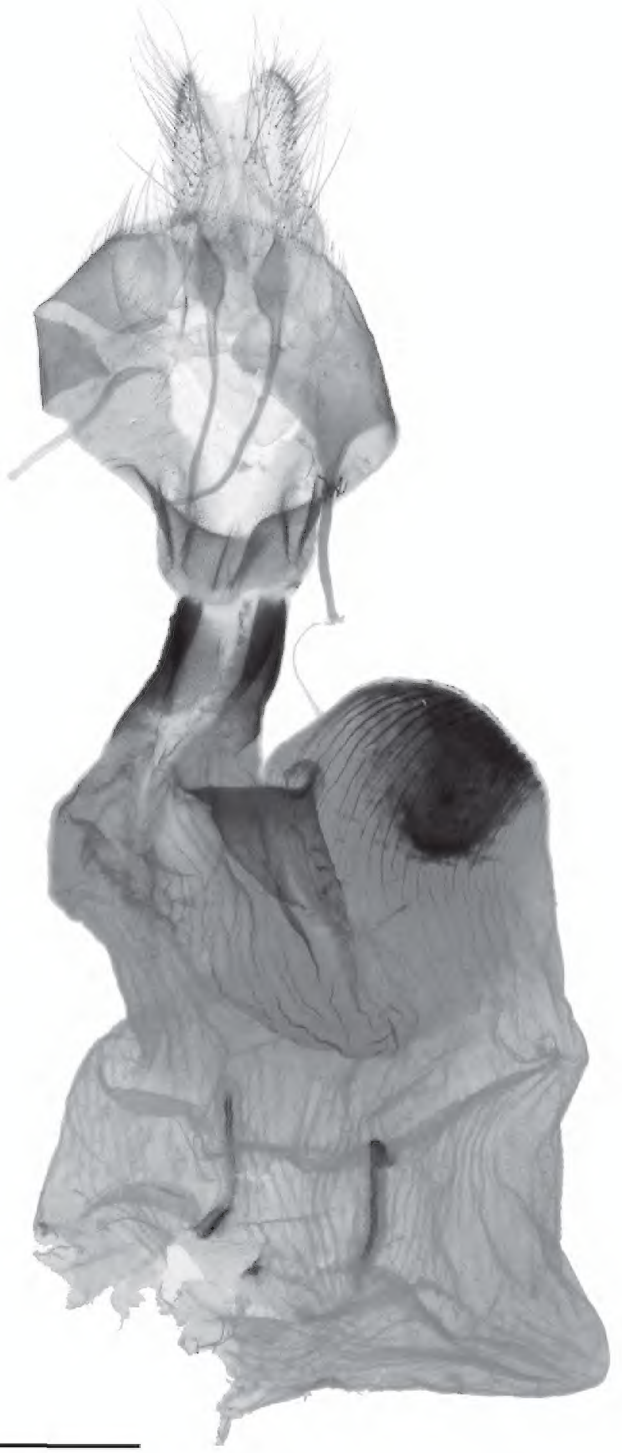

**Figure 10.** *Polymixis xanthomista*. female genitalia. Albania, Mal Çajup - Erind Village, 02.x.2019. Scale bar: 1 mm.

### *Egira anatolica* (Hering, 1933)

Albania, Mt. Thanës, near Bulqizë town, above Plani i Bardhë village, 833 m, 41°28'47.3"N, 20°9'12.2"E, 06.iv.2019, S. Beshkov and A. Nahirnić leg, 2 males, genitalia examined; Albania, Shkodra County, Stara village, Hot district, ca 500 m, 42°22'15"N, 19°28'13"E, 05.iv.2019, limestone area with *Quercus* spp., *Carpinus orientalis*, *Juniperus oxycedrus* L., *Fraxinus ornus* L., *Paliurus spina-christi* and clearing, S. Beshkov and A. Nahirnić leg, 1 male, genitalia examined. Second record for Albania, previously known from Qafa e Mollës near Tirana (Beshkov and Nahirnić 2020). SW Bulgaria: Struma valley, Skrinski Prolom Gorge, St. Todor Church near Boboshevo, 08.iv.2007, slopes with *Astragalus* spp., *P. spina-christi*, etc. S. Beshkov leg., 2 males, gen. preps 5–6./09.iv.2008, S. Beshkov, male genitalia with everted vesica on glass in euparal; Struma Valley, Kresna gorge, Kresnensko Hantche, ca 220 m, 41°46'59"N, 23°09'18"E, 02–04.iv.2003, S. Besh-

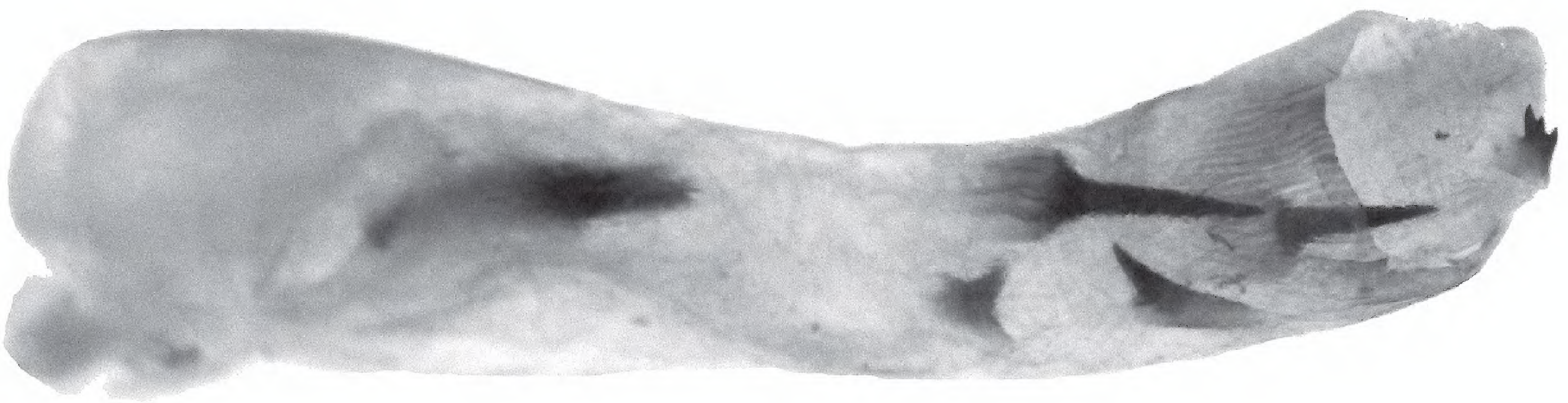

**Figure 11.** *Egira anatolica*, aedeagus. Albania, near Bulqizë town, 06.iv.2019. Scale bar: 1 mm.

**Figure 12.** *Egira conspicillaris*, aedeagus. Albania, Tirana Region, Dajti Mt, Qafmolla Pass, 04.iv.2019. Scale bar: 1 mm.

kov and M. Langourov leg., 3 males, genitalia examined, in micro vials in Glycerol; Struma Valley near Kamenitza village 200 m, 41°38'43"N, 23°09'59"E, 25.iii.2017, Maquis, S. Beshkov and B. Zlatkov leg, 1 male, genitalia examined, 04.iv.2003, S. Beshkov, M. Langourov, K. Ivanov & D. Tchobanov leg; S Pirin Mts, Malinova Burchina near Kalimantzi Village, 350 m, 41°27'58.6"N, 023°29'56.5"E, 09.iv.2005, Maquis, S. Beshkov, G. Petranyi and T. Harz leg.

*Egira anatolica* flies in early spring and is found in Bulgaria (Beshkov 2000), Macedonia (Beshkov 2014) and Serbia (Beshkov 2015). In Bulgaria it was known only from Rhodopi Mts, three localities reported in Zlatkov and Beshkov (2008) and from Belassitza Mts (Beshkov 2011), and it is reported here from more localities. The lack of records may be because of its early flight period and possible misidentification with other *Egira* species. Identification without examination of genitalia is generally easy, but for those with insufficient experience, dissection or at least checking of external genitalia after brushing with a fine brush is recommended. However, dissection is preferable as the size and number of the cornuti in the vesica are another differentiation between *E. anatolica* (Fig. 11) and *Egira conspicillaris* (Linnaeus, 1758) (Fig. 12).

***Mythimna* (*Morphopoliana*) *languida* (Walker, 1858) (= *consanguis* auct. nec Guenée, 1852)**

SW Bulgaria, Struma river valley, rocky hill above the fishpond near Levunovo village, Sandanski district; ca 120 m, 41°29'29"N, 023°16'07"E, 19.xi.2020 (Fig. 13), V. Gashtarov leg., 1 male (Fig. 14).

New to Bulgaria. In Macedonia it was known from Kicevo, 02.v.1981 (Pettersson 1990; Rezbanyai-Reser and Hausmann 2000). Recently reported as new for Albania in several coastal localities (Beshkov 2018; Beshkov and Nahirnić 2019). It has spread also recently in the rest of Europe: e.g. Germany (Heinicke 1997); Italy (Rezbanyai-Reser and Hausmann 2000); Spain (Yela and De Vrieze 2002), Sweden (Gustafsson and Malm 2021) or in Denmark (Karsholt and Nielsen 2013). In the Balkans known also from Central Greece and the Peloponnese (Hacker 1989). *Mythimna languida* is a palaeotropical-subtropical species known in Europe from the Mediterranean coast with some dispersal inland. In Bulgaria, as well as in the only locality in North Macedonia, the records are presumably due to migration. *Mythimna languida* has been found in the same locality with *C. accentifera*, another palaeotropical-subtropical species reported here.

**Figure 13.** Collecting locality of *Mythimna languida.* Bulgaria, near Levunovo, 19.xi.2020.

**Figure 14.** Mythimna languida, male. Bulgaria, near Levunovo, 19.xi.2020. Scale bar: 1 cm.

## Conclusion

In the Balkan Peninsula and within certain Balkan countries is still possible to find a species new to Europe, since the Balkans are insufficiently investigated, even for Macrolepidoptera. Some species, such as *Anchoscelis luteogrisea*, *Griposia bouveti pinkeri* and *Egira anatolica*, may be overlooked because for confirmation of the identification, full examination of genitalia is necessary. Most of the species reported here are on the wing in the early spring (*Eriogaster inspersa*, *Egira anatolica*) or late autumn (*A. luteogrisea*, *G. bouveti pinkeri* and *Polymixis xanthomista*) when collecting is sometimes problematic due to weather conditions. For some other palaeotropical-subtropical species found recently in the most southern and warmer locations of Bulgaria, such as *Ctenoplusia accentifera* and *Mythimna languida*, we are of the opinion that they have spread as a result of climate change. Similarly, some other species with palaeotropical-subtropical range previously recorded in Bulgaria from the southernmost area of the country have recently extended their range and have started breeding in the central parts of Bulgaria, e.g. *Lindenia tetraphylla* (Van der Linden, 1825) (Odonata) (Kolev and Boudot 2018) and *Lethocerus patruelis* (Stål, 1855) (Hemiptera) (Grozeva et al. 2013). In our opinion certain species with Atlantico-Mediterranean ranges such as *P. xanthomista* and *Menophra japygiaria* (O. Costa, 1849) colonised the Balkans from the Central Apennines to the Albanian coast directly, and not along the Adriatic coasts of Italy and Dalmatia (cf. Racheli and Zilli 1985; Schmitt and Varga 2012; Sucháčková Bartoňová et al. 2021).

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## References

Beshkov S (2000) An annotated systematic and synonymic check list of the Noctuidae of Bulgaria (Insecta: Lepidoptera: Noctuidae). Neue entomologische Nachrichten 49: 1–300.

Beshkov S (2014) Contribution on the Macrolepidoptera of the Republic of Macedonia with a report of one new genus and four new Noctuidae species for the country. The Entomologist's Record and Journal of Variation 126(5): 175–185.

Beshkov S (2015) Some new for Serbia and rare Lepidoptera species collected at light in Eastern Serbia. The Entomologist's Record and Journal of Variation 127(3): 127–134.

Beshkov S (2016) *Agrochola luteogrisea* (Warren, 1911) new for Bulgaria and Serbia and *Dryobotodes servadeii* Parenzan, 1982 (Lepidoptera: Noctuidae) new for Serbia with taxonomic notes on *Dryobotodes servadeii* and *Dryobotodes monochroma* (Esper, [1790]). The Entomologist's Record and Journal of Variation 128(5): 245–256.

Beshkov S (2017) Contribution to knowledge of the Lepidoptera fauna of the Balkan Peninsula. The Entomologist's Record and Journal of Variation 129(1): 9–33.

Beshkov S (2018) A Contribution to knowledge of the Balkan Lepidoptera: new and rare Erebidae and Noctuidae for Albania, collected in 2016. The Entomologist's Record and Journal of Variation 130(3): 155–172.

Beshkov S, Gashtarov V (2014) Short contribution on the early spring Macrolepidoptera of the Republic of Macedonia with a report of two new genera and four new Geometridae species for the country. The Entomologist's Record and Journal of Variation 126(4): 133–143.

Beshkov S, Nahirnić A (2018a) New and rare Noctuoidea species for Albania (Lepidoptera: Nolidae, Erebidae and Noctuidae). Atalanta 49(1–4): 159–170.

Beshkov S, Nahirnić A (2018b) Three new *Anchoscelis* Guenée, 1839 species for Albania and two for the Republic of Macedonia (Lepidoptera, Noctuidae). Atalanta 49(1–4): 171–176.

Beshkov S, Nahirnić A (2019) A contribution to knowledge of the Balkan Lepidoptera: species collected in the autumn of 2018 in Albania (Macrolepidoptera with some Crambidae). The Entomologist's Record and Journal of Variation 131(2): 66–102.

Beshkov S, Nahirnić A (2020) Contribution to knowledge of the Balkan Lepidoptera (Lepidoptera: Macrolepidoptera). Ecologica Montenegrina 30(2020): 1–27. https://doi.org/10.37828/em.2020.30.1

Beshkov S, Wegner H (2004) Macrolepidoptera of the Greek part of the Eastern Rhodopes. In: Beron P, Popov A (Eds) Biodiversity of Bulgaria. 2. Biodiversity of Eastern Rhodopes (Bulgaria and Greece). National Museum of Natural History, Sofia, 677–722.

de Freina JJ (1988) 5. Beitrag zur systematischen Erfassung der Bombyces- und Sphinges- Fauna Kleinasiens. Eine neue *Eriogaster*-Art, *Eriogaster nippei* spec. n. aus dem Taurus (Lepidoptera, Lasiocampidae). Atalanta 18: 379–383.

de Freina JJ (1999) 10. Beitrag zur systematischen Erfassung der Bombyces- und Sphinges- Fauna Kleinasiens. Weitere Kenntnisse über Artenspektrum, Systematik und Verbreitung der Lasiocampidae, Lemoniidae, Notodontidae, Thaumetopoeidae, Lymantriidae, Arctiidae und Cymatophoridae (Insecta, Lepidoptera). Atalanta 30(1/4): 187–257.

Griffiths HI, Kryštufek B, Reed JM [Eds] (2004) Balkan Biodiversity: Pattern and Process in the European Hotspot. Kluwer Academic Publishers, Dordrecht/Boston/London, 357 pp.

Grozeva S, Kuznetsova VG, Simov N, Langourov M, Dalakchieva S (2013) Sex chromosome pre-reduction in male meiosis of *Lethocerus patruelis* (Stål, 1854) (Heteroptera, Belostomatidae) with some notes on the distribution of the species. ZooKeys 319: 119–135. https://doi.org/10.3897/zookeys.319.4384

Gustafsson B, Malm T (2014) Svenska fjärilar. http://www2.nrm.se/en/svenska_fjarilar/svenska_fjarilar.html [date accessed 23.06.2021]

Hacker HH (1989) Die Noctuidae Griechendlands. Mit einer Übersicht über die Fauna des Balkanraumes (Lepidoptera, Noctuidae). Herbipoliana 2. Eitschberger, Markleuthen, 589 pp.

Heinicke W (1997) Erster Fund des Eulenfalters *Mythimna languida* (Walker, 1858) in Deutschland (Lep., Noctuidae). Entomologische Nachrichten und Berichte 41(3): 198–200.

Ignatov A, Wetton P, Beshkov S (2013) *Chilades trochylus* (Freyer, [1845]) (Lep.: Lycaenidae) confirmed for the Bulgarian fauna and doubt cast on earlier records of this and other species. The Entomologist's Record and Journal of Variation 125(3): 119–122.

Karlsholt O, Nielsen PS (2013) Revideret fortegnelse over Danmarks Sommerfugle.: Revised Checklist of the Lepidoptera of Denmark. I Revideret fortegnelse over Danmarks sommerfugle. København: Lepidopterologisk Forening, København, 120 pp.

Kolev Z (2002) Critical notes on some recent butterfly records (Lepidoptera: Papilionoidea & Hesperioidea) from Bulgaria and their source collection. Phegea 30(3): 95–101.

Kolev N, Boudot J-P (2018) Evidence of reproduction of *Lindenia tetraphylla* in Bulgaria (Odonata: Gomphidae). Notulae odonatologicae 9(1) 2018: 11–17.

Pettersson C-A (1990) *Aletia languida* Walk., a moth new for Yugoslavia (Lep., Noctuidae, Hadeninae) and other Lepidoptera species collected in Yugoslavia. Acta entomologica Jugoslavica 23(1–2): 73–77.

Plant CW, Beshkov S, Nahirnić A (2020) A new species of *Elegia* (Lepidoptera, Pyralidae, Phycitinae) from the Balkan Peninsula. Nota Lepidopterologica 43: 311–318. https://doi.org/10.3897/nl.43.54508

Racheli T, Zilli A (1985) Modelli di distribuzione dei Lepidotteri nell'Italia meridionale. Biogeographia 11: 165–194. https://doi.org/10.21426/B611110302

Rezbanyai-Reser L, Hausmann A (2000) Eine Berichtigung: *Mythimna* (*Morphopoliana*) *languida* (WALKER, 1858) auch in Deutschland und Makedonien (Lepidoptera: Noctuidae). Atalanta 31 (3/4): 529–530. https://www.zobodat.at/publikation_articles.php?id=225502

Ronkay L, Mészáros Z (1982) Notes on the genus *Agrochola* Hübner, 1821. Folia Entomologica Hungarica 43(1): 147–150.

Ronkay L, Ronkay G, Gyulai P, Varga Z (2017) Xyleninae I. The Witt Catalogue: A Taxonomic Atlas of the Eurasian and North African Noctuoidea. Heterocera Press, Budapest, 342 pp.

Ronkay L, Yela JL, Hreblay M (2001) Hadeninae II. – Noctuidae Europaeae5, Sorø, 452 pp.

Rosenbauer F, Theimer F (2016) *Eriogaster inspersa* Staudinger, 1879: new for the fauna of Europe (Lepidoptera: Lasiocampidae). Nachrichten des Entomologischen Vereins Apollo 37(2/3): 159–160.

Schmitt T, Varga Z (2012) Extra-Mediterranean refugia: The rule and not the exception? Frontiers in Zoology 9(22): 1–12. https://doi.org/10.1186/1742-9994-1-1

Slivov A, Lukov H (1976 [1977]) Beitrag zur Erforschung der Schmetterlinge in Bulgarien. Terrestrian Fauna of Bulgaria, Materials. Sofia, Bulgarian Academy of Sciences: 234–242.

Sucháčková Bartoňová A, Konvička M, Marešová J, Wiemers M, Ignatev N, Wahlberg N, Schmitt T, Fric ZF (2021) Wolbachia affects mitochondrial population structure in two systems of closely related Palaearctic blue butterflies. Scientific Reports 11(3019): 1–14. https://doi.org/10.1038/s41598-021-82433-8

Tóth B (2019) *Charissa pfeifferi* (Wehrli, 1926) and *Operophtera fagata* (Scharfenberg, 1805) in North Macedonia (Lepidoptera: Geometridae). Natura Croatica 29(2) 473–478. https://doi.org/10.20302/NC.2019.28.33

Varga Z (2014) Biogeography of the high mountain Lepidoptera in the Balkan Peninsula. Ecologica Montenegrina 1(3): 140–168. https://doi.org/10.37828/em.2014.1.21

Wegner H (2002) Herbst- und Frühjahrsbeobachtungen zur Noctuidae-Fauna in Nord-Griechenland (Lepidoptera, Noctuidae). Esperiana 9: 7–20.

Wegner H (2011) Zweiter Beitrag zur Frühjahrs- und Herbst-Noctuidenfauna von Nordgriechenland (Lepidoptera, Noctuidae). Esperiana 16: 39–65.

Yela JL, De Vrieze M (2002) *Mythimna* (*Morphopoliana*) *languida* (Walker, 1858): first records for the Ibero-balearic area (Lepidoptera: Noctuidae: Hadeninae). Boletin de la Sociedad Entomologica Aragonesa 30: 165–167.

Zlatkov B, Beshkov S (2008) New and rare Macrolepidoptera (Insecta: Lepidoptera) from Bulgaria. Acta zoologica bulgarica, Supplement 2: 325–330.

Zolotuhin VV (2007) On the identity of the Turkish species of the *Eriogaster rimicola*-group (Lasiocampidae). Nota Lepidopterologica 30(1): 45–50. https://nl.pensoft.net/